

The Race For Light Bulb Supremacy

By [Rory Crump](#) on September 8, 2011

LED bulb makers are grabbing shovels and rushing to bury incandescent light in the U.S. Starting in 2012, provisions in the Energy Independence and Security Act (EISA 2007) will put the 100-watt incandescent bulb to death, illuminating the Department of Energy's quest for greener light. In their own quest for glory, bulb giants Philips and GE and leaner players Cree and Switch have left CFL bulbs in a dim, flickering dust.

Tea Partiers fought to repeal the bulb ban, claiming the government shouldn't tell us how to light our homes. And consumer advocates point out the energy-efficient bulbs, based on both price and performance, are more Stone Age than Jetsons. At less than a dollar each, household light bulbs have become a commodity for most consumers. Cries of "light-bulb socialism" echo throughout the Western world as 100-watt bulbs have been missing from UK shelves since 2009. Met with underwhelming support, the EU pioneered the stair-step approach phasing out incandescent bulbs now being followed by the U.S.

EU consumers began hoarding 75-watt bulbs in anticipation of their banning in 2010. New Zealand made the light bulb a key 2008 election issue, with the winning National Party eventually overturning the ban on incandescent bulbs. Makes you wonder whether Thomas Edison ever fashioned his invention a political lightning rod - or the tipping point of an election.

Republican presidential hopeful Michelle Bachmann takes regular shots at light bulbs, and according to adversaries her rants extolling anti-consumerism border on conspiracy. Bachmann pushed the Better Use of Light Bulbs (BULB) Act, proposing legislation to repeal certain aspects of EISA 2007. BULB failed, but the debate shines on.

If Bachmann hates the little light bulb so much, let's consider the source of her rage. After all, we have all been burned - by them - before.

It can't be just be partisan politics. Republican George W. Bush signed EISA 2007 with the hopes of reducing both greenhouse gases and energy usage. The provisions for light bulbs in EISA 2007 are not mandates. There will be no FBI sting rounding up those still flaunting incandescent bulbs in their bathrooms. Only the sale of 40 to 100-watt bulbs not meeting new efficiency requirements will be phased out and no longer for sale (look out for a huge cottage industry on eBay, maybe even a black market).

Another misconception revolves around substitutes. Compact fluorescent lamps (CFLs) were the original frontrunner in the lighting race, and misinformed consumers assumed these dim, pricey, mercury-filled twisters would soon invade their homes. Halogen is an option. But the lamp industry is hedging all its bets on LEDs, the Ferrari, or in this case, the Tesla of light bulbs.

Why are incandescent bulbs going the way of the eight-track tape and mood ring anyway? Most

of the energy pumped into them burns off as heat, leaving less than 10 percent for light. Finding an efficient alternative has far-reaching effects: greenhouse gases, foreign oil and billions of dollars are in the DOE's crosshairs.

DOE projects by 2030 LEDs would save 190 terawatt hours of energy annually, equating to \$15 billion in cost savings. That's a 25-percent cut in overall energy savings based on the incandescent legacy scenario, enough to light more than 95-million U.S. homes. Cap off approximately 31-million tons of carbon from the atmosphere and we've got something...enough for DOE to slap a \$10 million bounty on the first LED maker to deliver 2,000, 60-watt equivalent bulbs drawing no more than 10 watts of electricity.

Created in 2008 to jumpstart the LED race, the "L Prize," or Bright Tomorrow Lighting Prize, has been a loose benchmark for both specifications and productivity inside the heating LED market. Philips recently took home the first L-Prize, surviving DOE's rigorous tests with a bulb expected to hit stores in 2012.

Problem is, Philips was running unopposed. Whether \$10 million is chump change, or potential fat government contracts just aren't their thing, other LED players have chosen to stay in the lab, hoping their Frankenstein will crush the ocean gap - and political jabs - existing between incandescent cost and next-gen lamp supremacy. Although LEDs are nearly as old as Michelle Bachmann, the trick in turning expensive, blue diodes into cheap, white light takes a few more skills than breeding comic-book sea monkeys.

LED bulb making requires a mashup of disciplines, and the mixed-martial artists of science dominate this nubile side of the lamp industry. If you know someone with black belts in chemistry, physics and optics - plus dogged persistence - then you should warn them they are missing the LED fight. They must speak lumens, efficacy and ambience. Throw in lukewarm VCs, gorilla manufacturing and big-box distribution - the economies of scale coloring the mature industry - and it's apparent why a nimble, faster LED lab hasn't secured the lead.

But that may change.

Cree convinced President Obama to join their "LED Revolution," a mantra claiming breakthroughs in optical design, electronics design, mechanical design and thermal management. Innovation they call TrueWhite Technology. Innovative enough for Obama to pay a visit to Cree's Durham, N.C. headquarters and bask in their progressive light. In January, Cree announced a prototype that spun heads. Cree claimed in a press release, "no commercially available LED A-lamps meet the ENERGY STAR® performance requirements for 60-watt standard replacement bulbs at this level of efficiency and light quality."

Sleek enough for Vanity Fair and heady enough for the New York Times, Silicon Valley's **Switch** has the media buzzing over both its Matrix-like bulb design and parlor tricks they've employed to bring their LED closer to mainstream. For Switch, the key is in the coolant: the secret sauce transferring heat throughout their 60-watt design. And with a \$30 sticker price rated for 20,000 hours, Switch thinks they've reached a breakeven for commercial viability. Switch is currently taking orders for November delivery of their 60 and 75-watt artistic and engineering marvels.

But the reigning champions of the lamp industry won't go quietly. Philips has both an L Prize and the first 60-watt equivalent LED on the market. Home Depot carries the entire AmbientLED line of Energy Star-approved bulbs. Yellow with black racing stripes, the LED pioneer promises

its own design twist replicates the best qualities of incandescent bulbs, easing sticker shock from the \$40 price tag.

GE still has a big play in CFLs, but is ramping up their Energy Smart line to include low-end LEDs. With a fin-like, throwing star look, the 40-watt entry carries a 25,000-hour shelf life. But pushing \$50 - don't drop it.

Don't blame the "radical environmentalists" for this one. The LED-bulb race is a worthy example of sharp minds meeting sound policy. Market forces will eventually decide the winner, and a lighting example of Moore's Law will drive down prices to a point where consumers, with a clear conscience, will buy bulbs built for both speed and distance.

Let there be LED light.